

CLAIMS

What is claimed is:

1. A mobile robot, comprising:
a body;
a wheel connected with the body and configured to move in first and second directions relative to the body; and
a wheel guide unit coupled at a first end thereof to the body and at a second end thereof to a hub of the wheel, the wheel guide unit being contracted when the body is spaced apart from a surface on which the mobile robot moves,
wherein the wheel guide unit expands to allow the wheel to be in contact with the surface when the body comes into contact with the surface.
2. The mobile robot according to claim 1, further comprising:
a drive motor connected with the body; and
a power transmission unit configured to transmit power from the drive motor to the wheel.
3. The mobile robot according to claim 1, further comprising:
a sub-guide unit coupled to the wheel so as to rotate around a shaft of the drive motor.
4. The mobile robot according to claim 1, wherein the body includes a guide slot which guides a movement of the wheel guide unit, and
wherein the wheel guide unit includes an insert part which is inserted in the guide slot of the body.
5. A mobile robot, comprising:
a body;
a wheel connected with the body and which moves in first and second directions relative to the body;
a power spring connected with the body; and

a wheel guide unit coupled at a first end thereof to the power spring and at a second end thereof to a hub of the wheel, the wheel guide unit being contracted when the body is spaced apart from a surface on which the robot moves,

wherein the wheel guide unit rotates, when the body comes into contact with the surface to allow the wheel to be in contact with the surface.

6. A mobile robot, comprising:

a body having a first end and a first lower surface near the first end, the first lower surface being inclined from a horizontal plane of a bottom-most portion of the body;

a wheel connected with the body and which moves in first and second directions relative to the body; and

a wheel guide unit coupled at a first end thereof to the body and at a second end thereof to a hub of the wheel, the wheel guide unit being contracted when the body is spaced apart from a surface on which the mobile robot moves,

wherein the wheel guide unit expands to allow the wheel to be in contact with the surface when the body comes into contact with the surface.

7. The mobile robot according to claim 6, wherein the body includes a support bracket having a first locking hole, an arc-shaped guide slot and an annular boss.

8. The mobile robot according to claim 7, wherein the annular boss includes a motor shaft hole,

wherein the drive motor includes a motor shaft disposed through the motor shaft hole.

9. The mobile robot according to claim 7, wherein the wheel guide unit includes a spring guide and a coil spring fitted over the spring guide.

10. The mobile robot according to claim 9, further comprising:

a cylindrical coupling boss,

wherein the spring guide includes a cylinder and a piston,

wherein the cylindrical coupling boss is disposed at an upper end of the cylinder and couples the cylinder to the first locking hole, and

wherein the cylinder is rotatable about the first locking hole.

11. The mobile robot according to claim 7, further comprising:
a sub-guide unit coupled to the wheel; and
a coupling ring fitted over the annular boss,
wherein the coupling ring is in contact with an outer surface of the annular boss.
12. The mobile robot according to claim 11, wherein the sub-guide unit includes a second locking hole and a gear support boss, and
wherein the second locking hole opens toward the wheel guide unit and the gear support boss extends in a direction opposite the wheel guide unit.
13. The mobile robot according to claim 11, wherein the sub-guide unit is connected with the support bracket, and
wherein the sub-guide unit distributes a force on the power transmission unit and the wheel guide unit.
14. The mobile robot according to claim 9, wherein the power transmission includes a drive gear and a driven gear, the driven gear fixedly connected with the wheel and the drive gear connected with the drive motor, the drive gear and the driven gear being in meshed contact,
wherein a part of the piston moves downward along the arc-shaped guide slot when the spring expands, and
wherein a center of the driven gear and a center of the wheel move with the part of the piston along the arc-shaped guide slot when the spring expands, maintaining a contact force of the wheel against the surface.
15. The mobile robot according to claim 6, wherein the wheel is maintained at a particular height when the mobile robot is moving and when the surface is flat,
wherein the first lower surface of the body raises the body when the first lower surface contacts a raised obstacle on the surface, removing a load of the weight of the mobile robot from the wheel, the wheel maintaining contact with the surface to surmount the obstacle.

16. The mobile robot according to claim 15, wherein the wheel moves toward the body and the normal position of the body is restored after the mobile robot surmounts the raised obstacle.

17. The mobile robot according to claim 6, wherein the wheel moves from a first distance relative to the body to a second distance relative to the body according to a variation in elevation of the surface.

18. The mobile robot according to claim 9, wherein the wheel extends from the body toward the surface, and

wherein a load of a weight of the body is released from the wheel and the coil spring is loosened to allow the wheel to move in contact with the surface when the wheel contacts an obstacle on the surface.